Global VIIRS Imagery

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STAR JPSS Annual Science Meeting
27-30 August 2018
College Park, MD

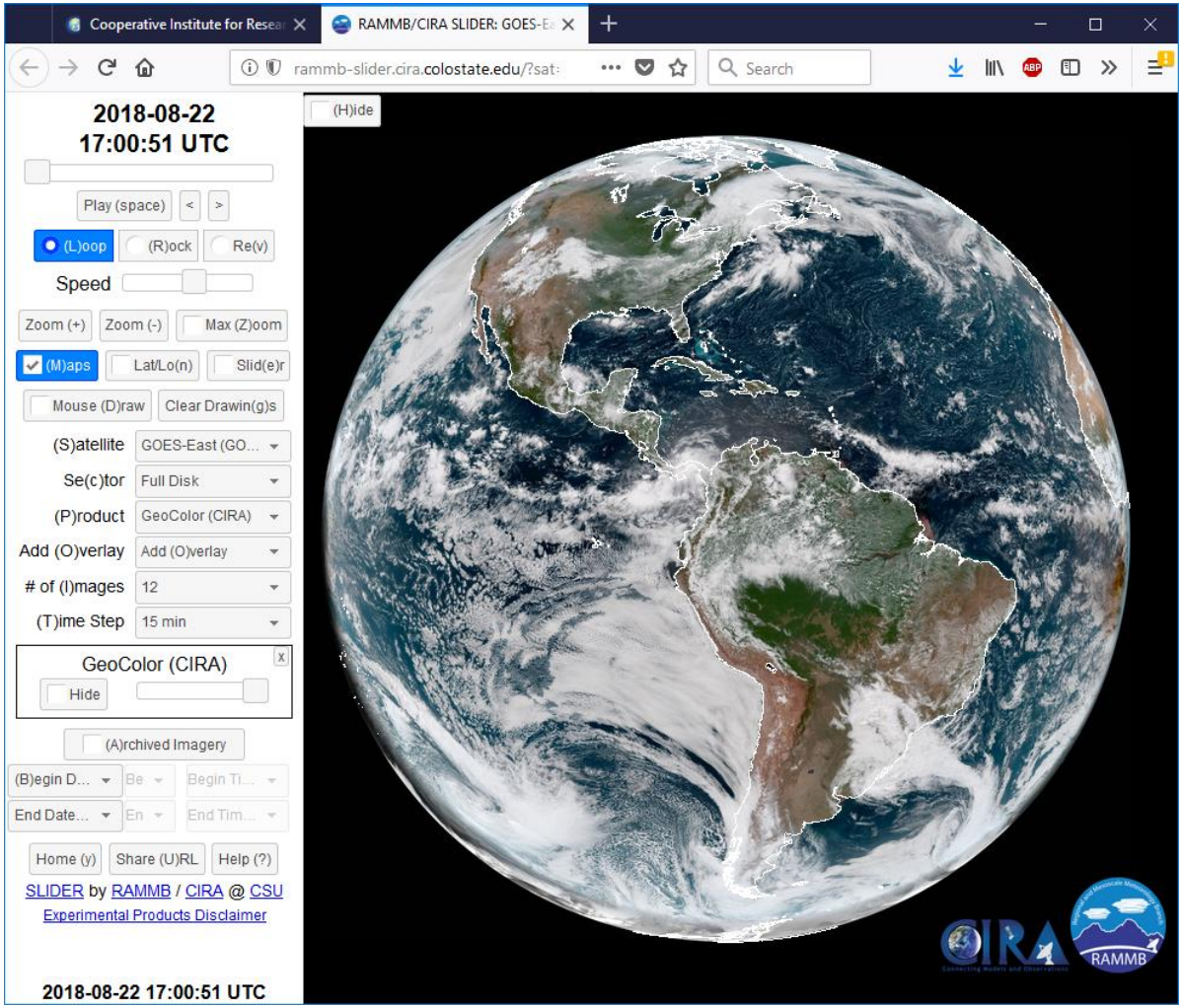
CIRA's SLIDER Website

22 June 2017: CIRA launched SLIDER to the public

SLIDER: Satellite Loop Interactive Data Explorer in Realtime

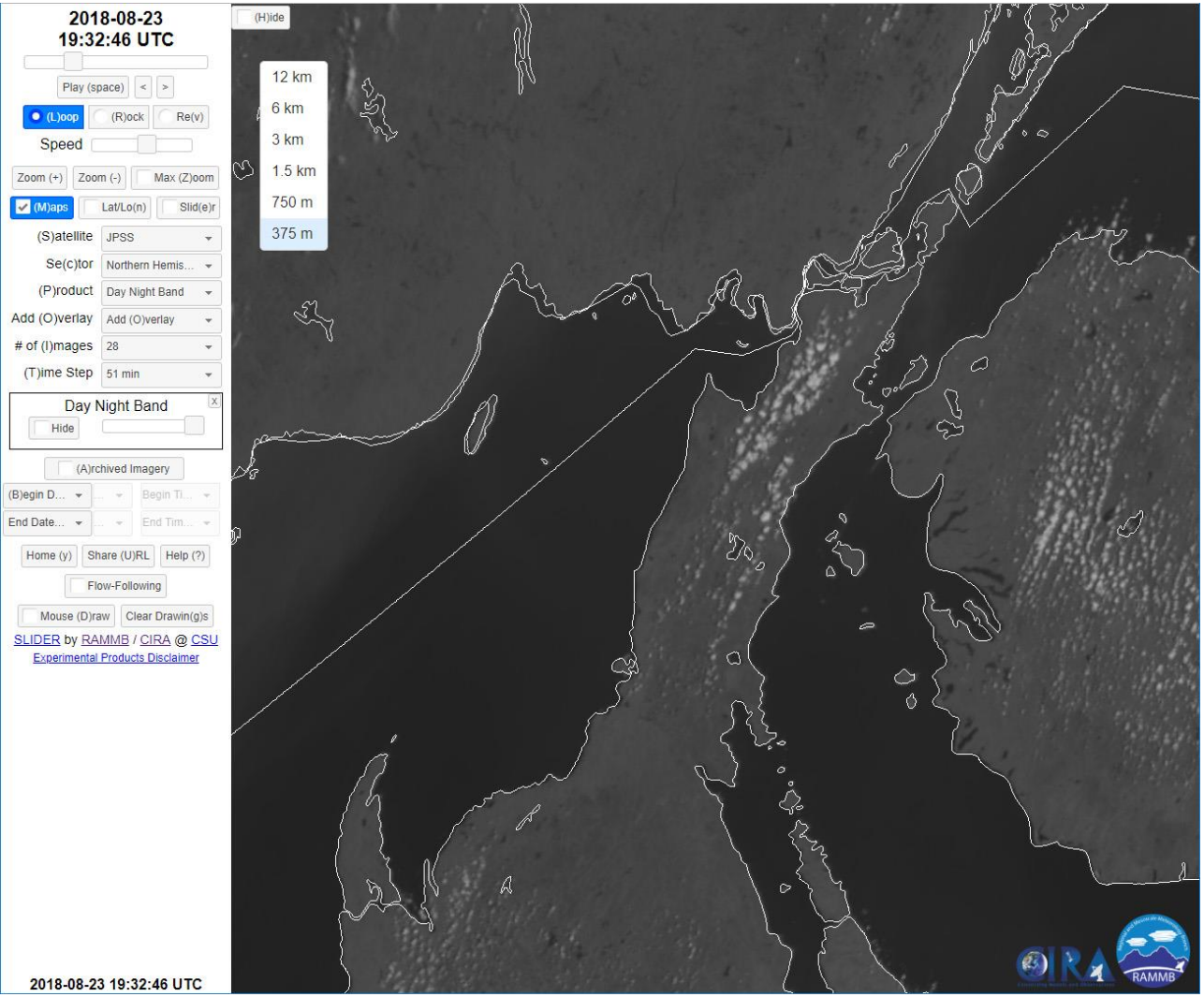
This website was designed to loop GOES-R (16/17) and Himawari-8 images in realtime

Imagery is displayed at varying zoom levels from the full view of the full disk (16 km), down to the full resolution of the visible channels (500 m)



http://rammb-slider.cira.colostate.edu

Introducing Polar SLIDER

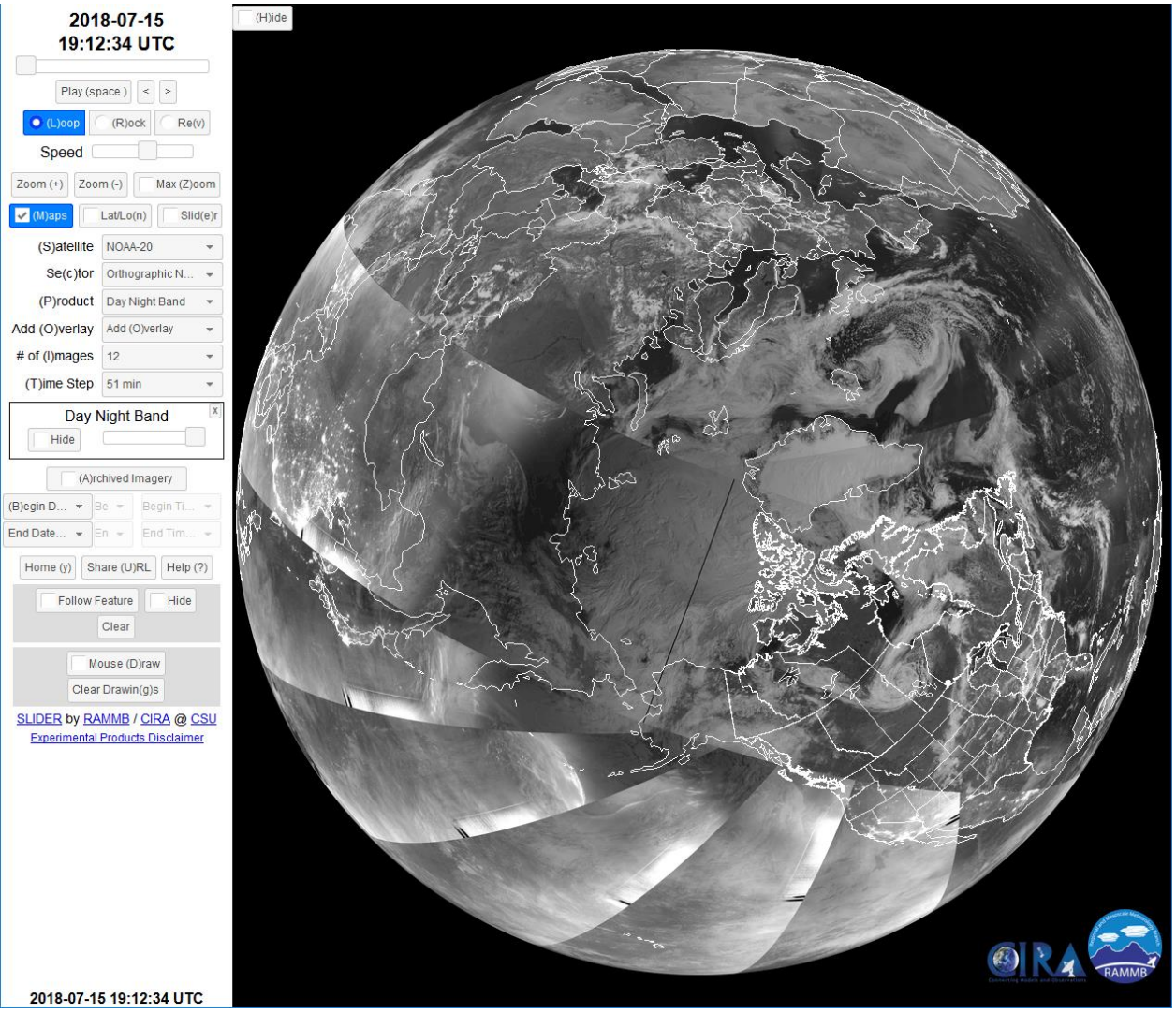


CIRA is nearing the launch of a new version of SLIDER designed to show polar satellite data in near-realtime.

Polar SLIDER shows satellite data for the entire globe at 6 zoom levels ranging from 12 km to 375 m, the resolution of the VIIRS Imagery bands (I-bands).

Click through to see the 6 zoom levels on a sample VIIRS Day/Night Band image composite of the Northern Hemisphere.

Introducing Polar SLIDER



The goal of Polar SLIDER is to show the most recent VIIRS data (all 22 bands) for each location on Earth at all times - with low-enough latency to be useful for forecasters.

This is the Northern Hemisphere view, showing one day of NOAA-20 Day/Night Band imagery.

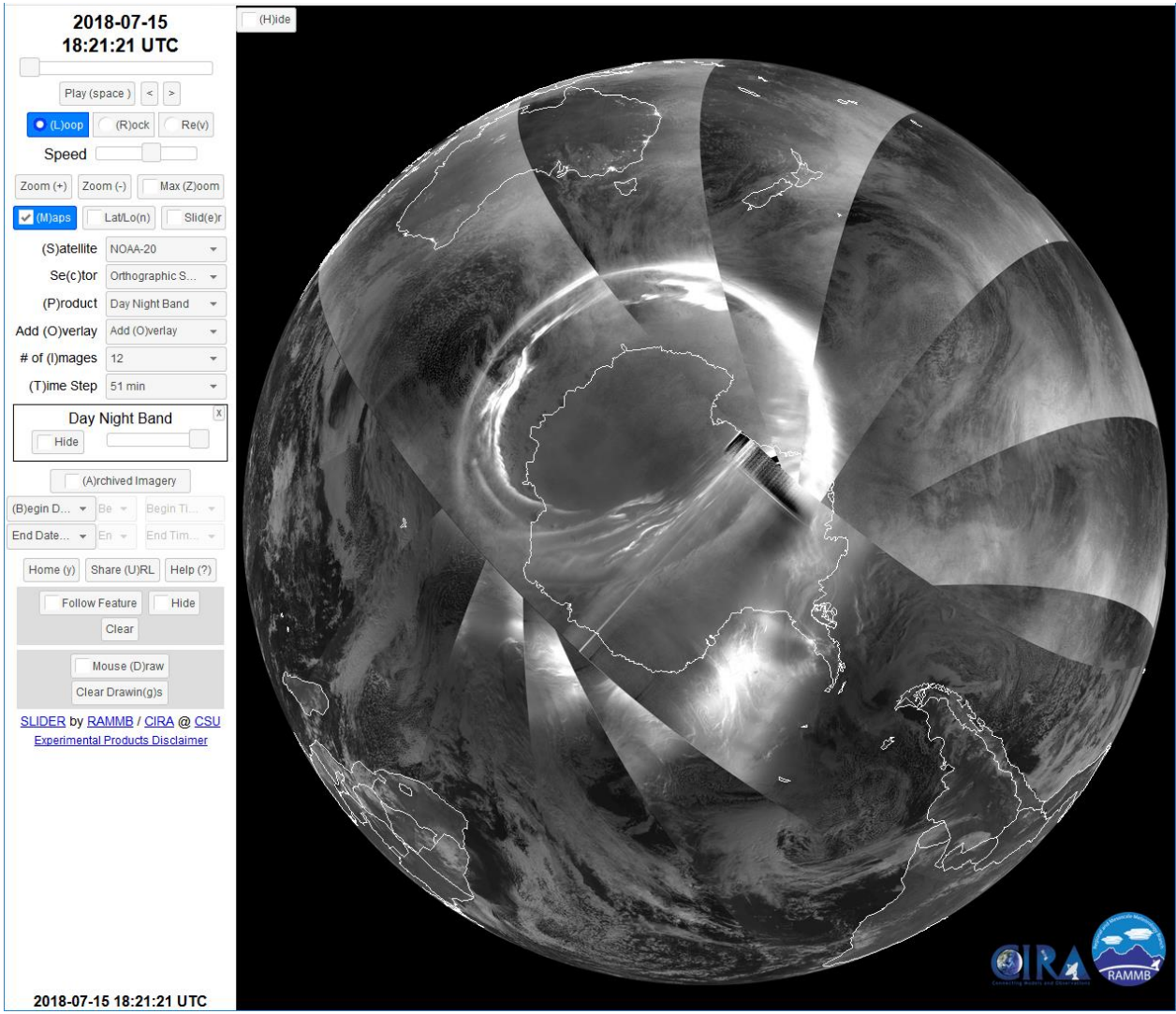
Animated GIF

Southern Hemisphere View

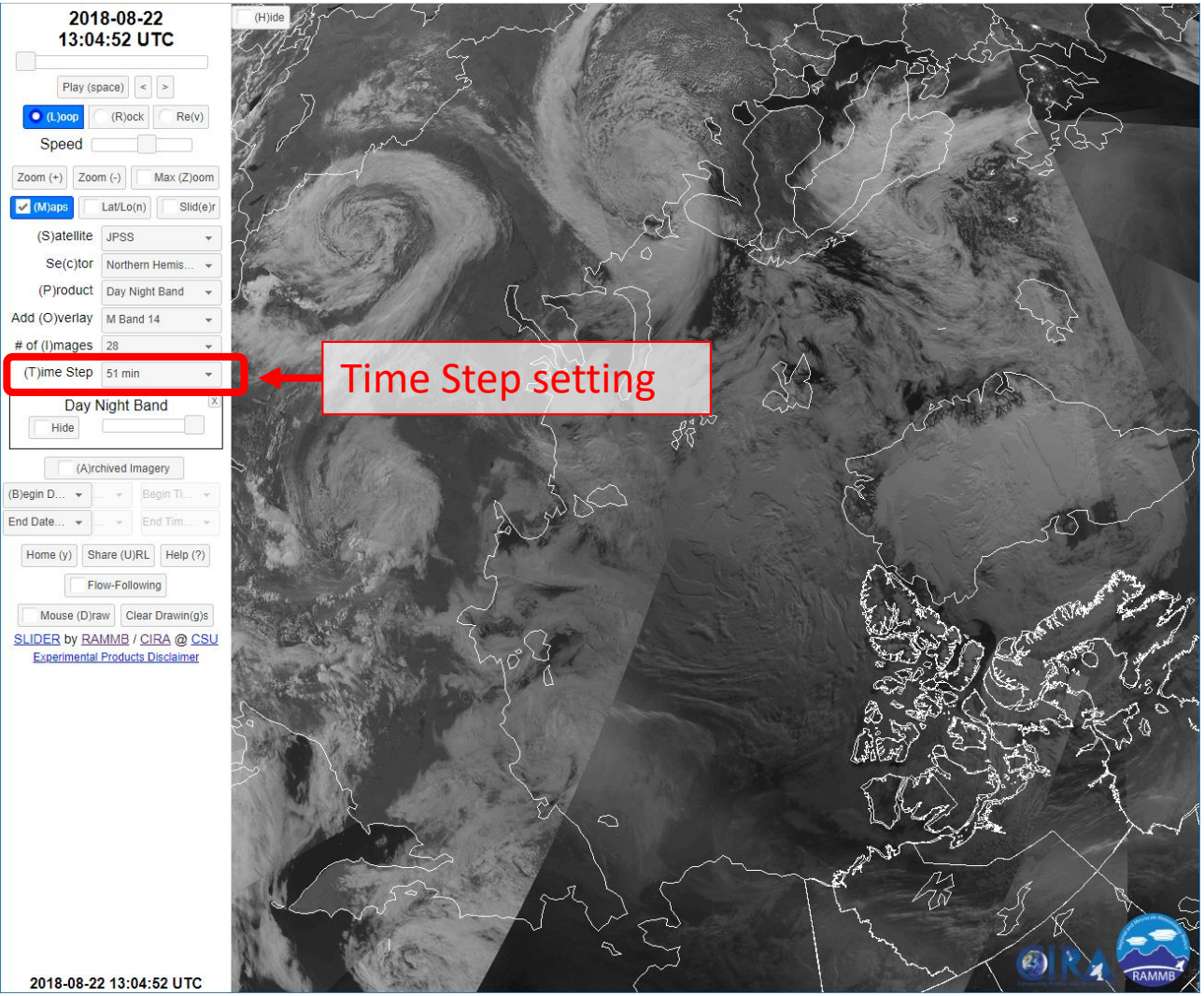
Here is the Southern Hemisphere view of Polar SLIDER.

Since it is winter and perpetual night in this example (15-16 July 2018) over Antarctica, the aurora is present in nearly every VIIRS overpass.

Animated GIF



Twice the VIIRS



By default, Polar SLIDER shows both VIIRS (S-NPP and NOAA-20). This is like having a geostationary satellite hovering over each pole!

If you are a S-NPP snob (or NOAA-20 snob) you can choose to display only one satellite by changing the loop time step from 51 min. to 102 min.

Animated GIF

All Your Favorite Features

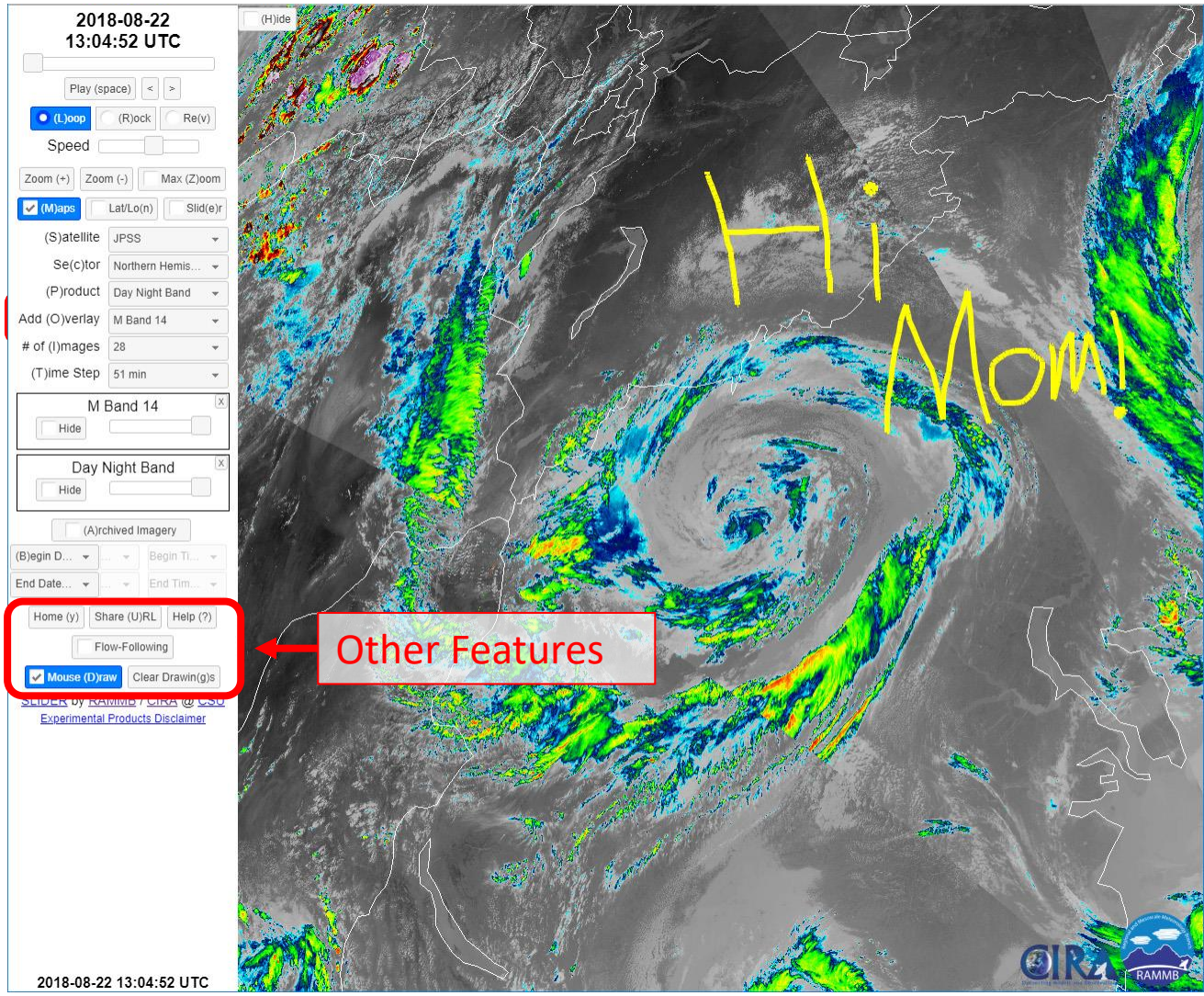
The “Add Overlay” feature allows you to compare two spectral bands or blend them together.

One popular use is the “Sandwich Product” which blends longwave IR imagery with visible imagery to provide unique detail of the cloud top structure.

Since we have the Day/Night Band, we can extend the utility of the Sandwich Product to nighttime as well!

The “Slider” bar with overlay turned on lets you easily compare two spectral bands.

Other features include: “Flow-Following” for feature tracking, “Mouse Draw” for annotations, and “Share URL” for easy sharing.



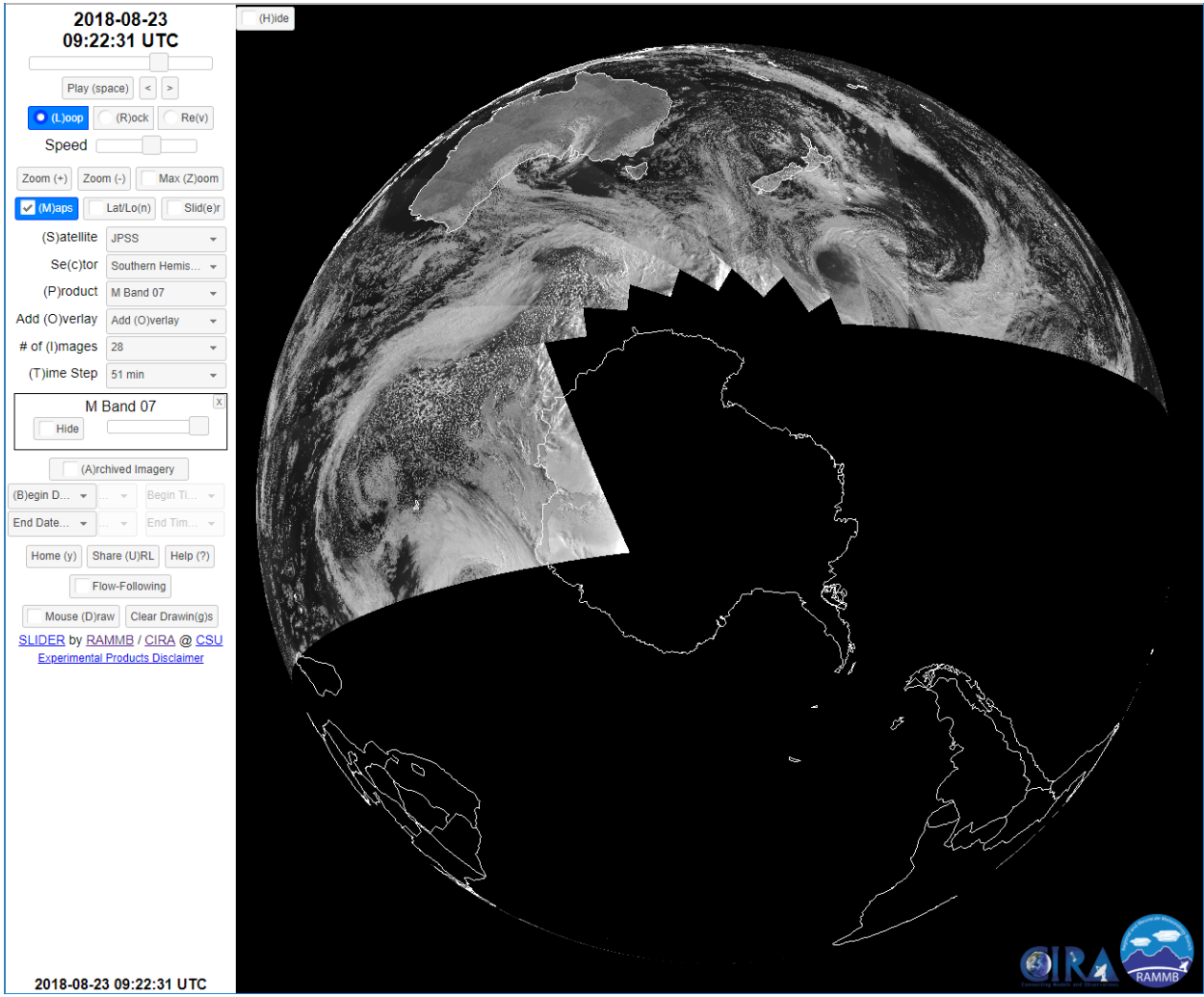
Cautionary Tales

Full resolution images are 16,000 x 16,000 (M-bands, DNB) and 32,000 x 32,000 pixels (I-bands), increasing the load on your browser compared to ABI

For the Solar Reflective Bands (M1-M11, I1-I3) in the summer months, more than half the image will be illuminated. In the winter months, more than half the image will be black, and you lose information over the poles. (But you still have the DNB and IR bands.)

The more VIS/NIR data there is in the Northern Hemisphere, the less there is in the Southern Hemisphere (and vice versa).

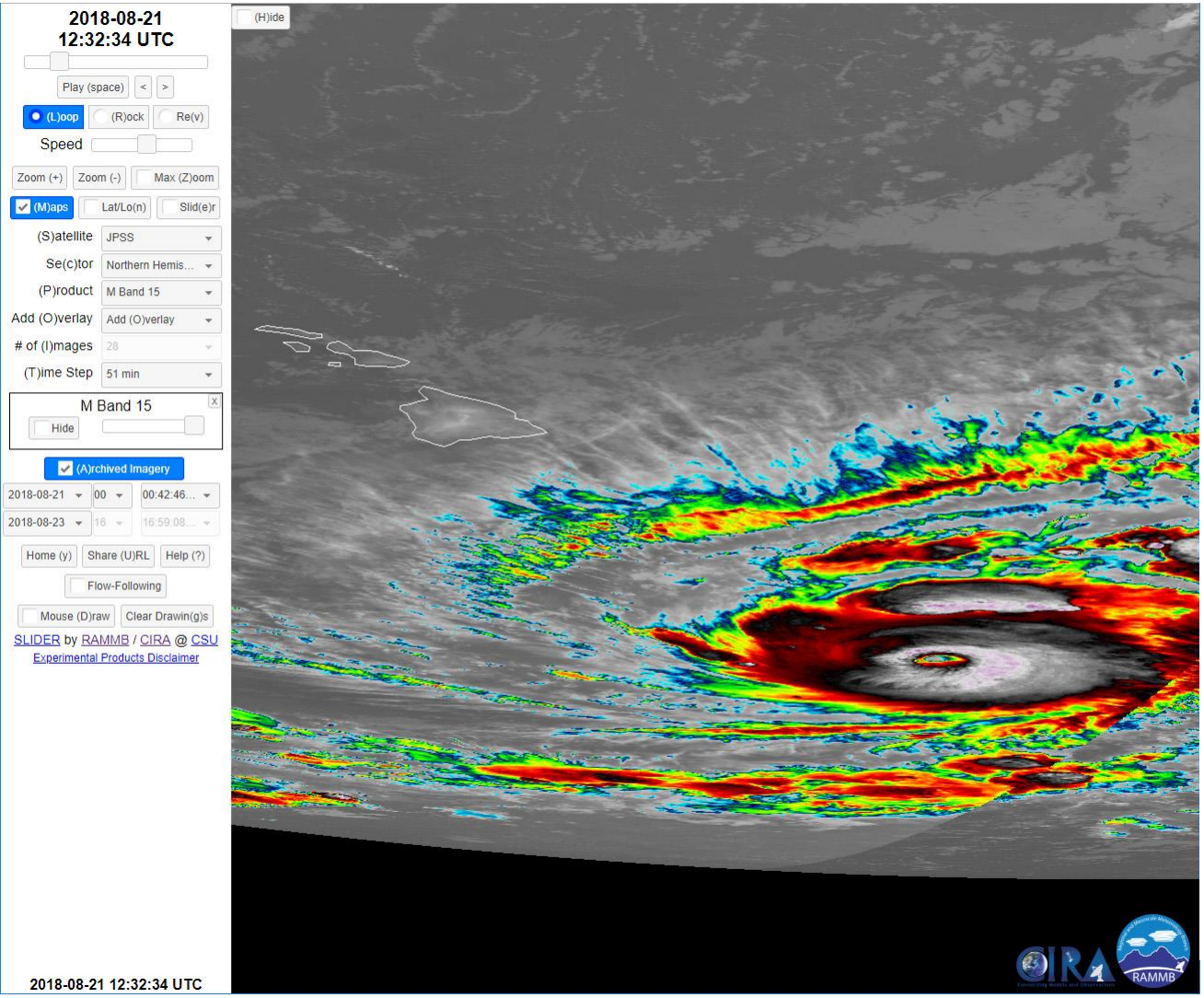
It should also go without saying that, the closer you are to the pole, the more overpasses you get, improving apparent motions and the feature tracking ("Flow-Following") utility.



Animated GIF

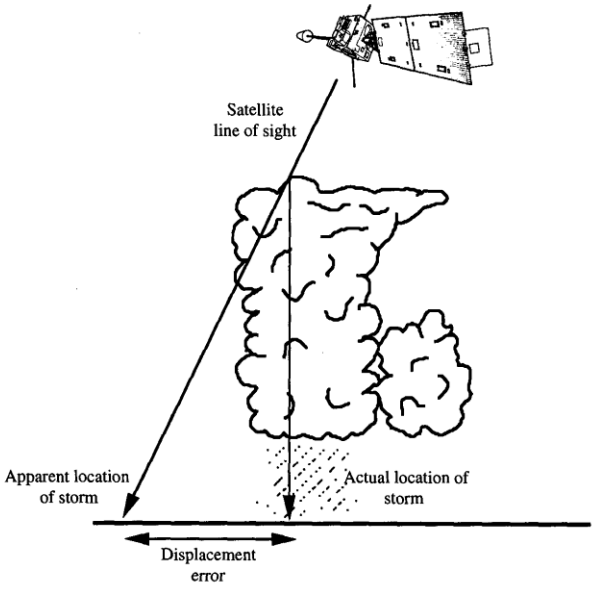
Some of the data in each image is up to 12 hours old!

Hurricane Lane



Parallax effects may be significant for objects near the edge of scan, leading to apparent motion that is not actually occurring.

Hurricane Lane did not move back to the east during this time period.

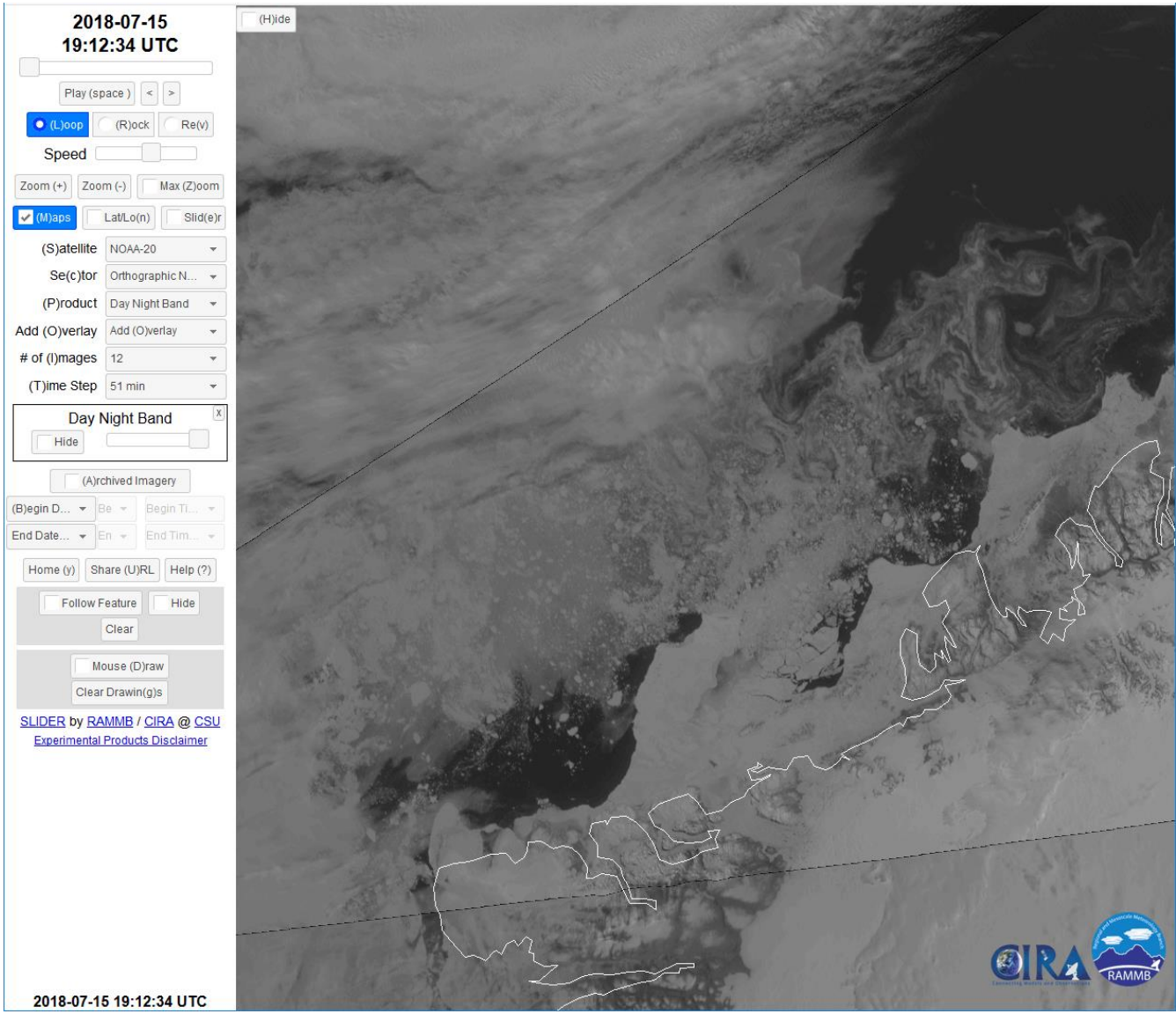


Ice, Ice, Baby

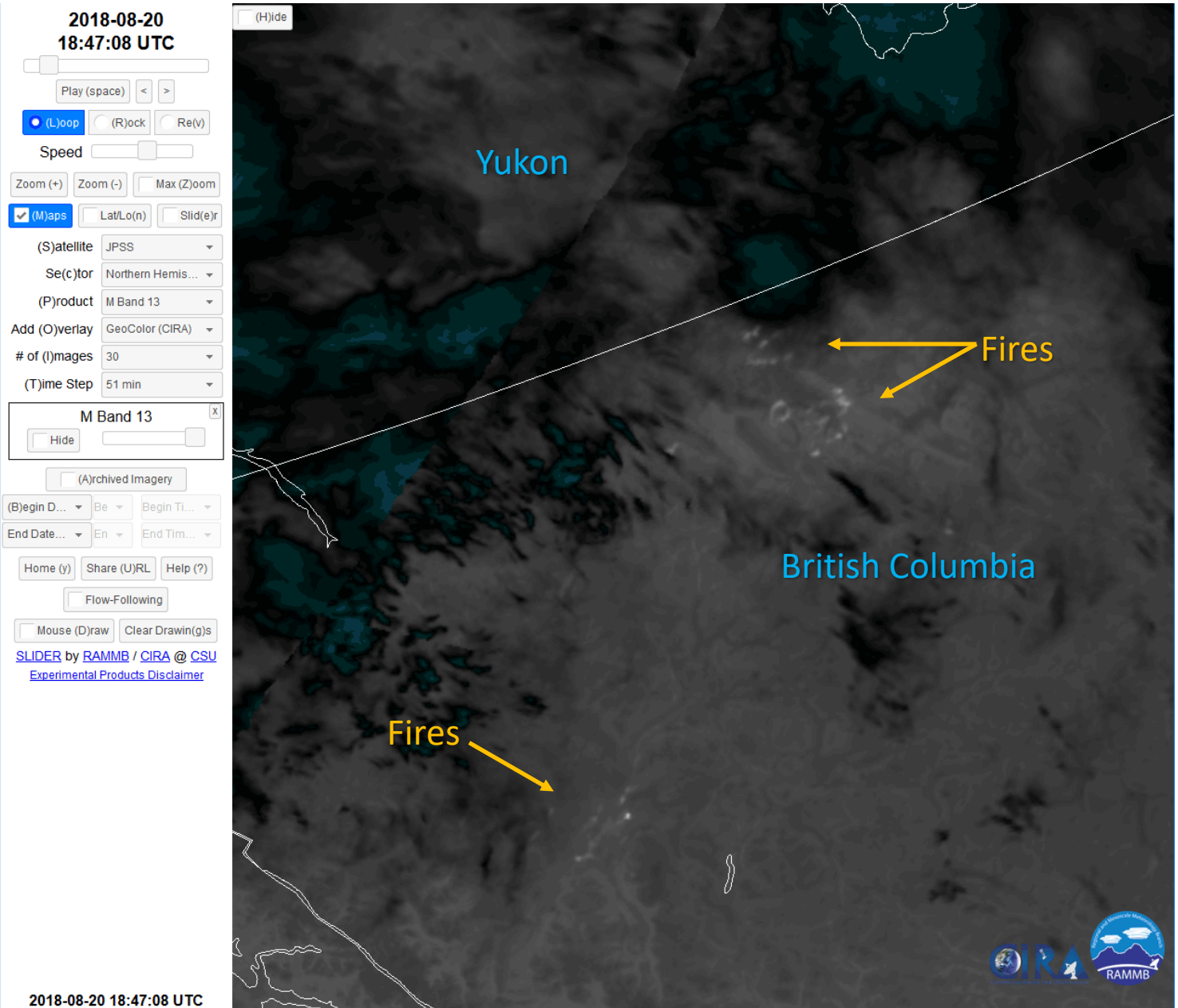
Ice off the east coast of Greenland in the Day/ Night Band (15-16 July 2018).

Note the complicated motions due to a combination of currents and tidal flows.

Animated GIF



British Columbia Fires

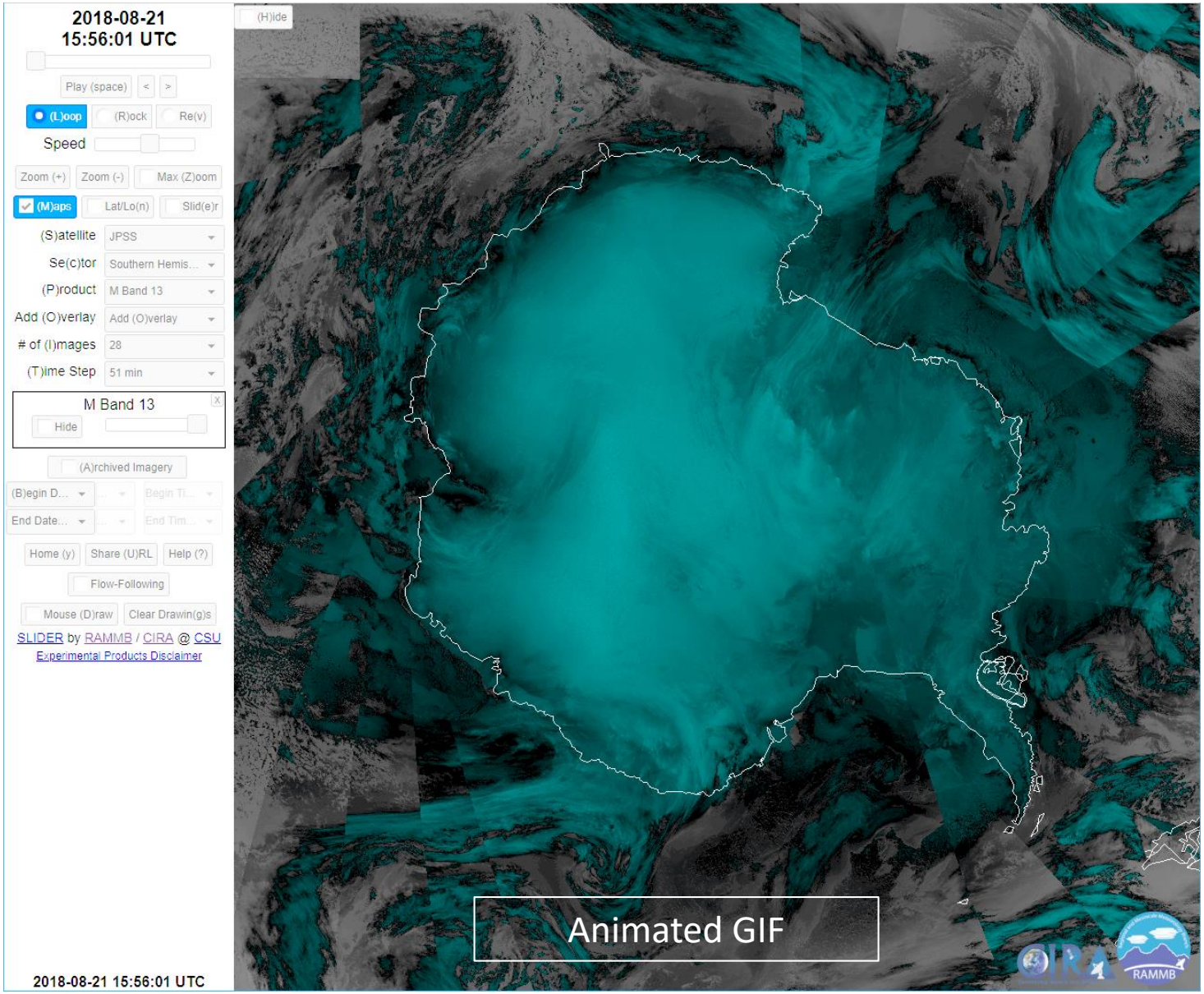


S-NPP and NOAA-20 combine to give this region 6 consecutive overpasses, each 51 min. apart, between 18:47 UTC and 22:10 UTC (21 August 2018).

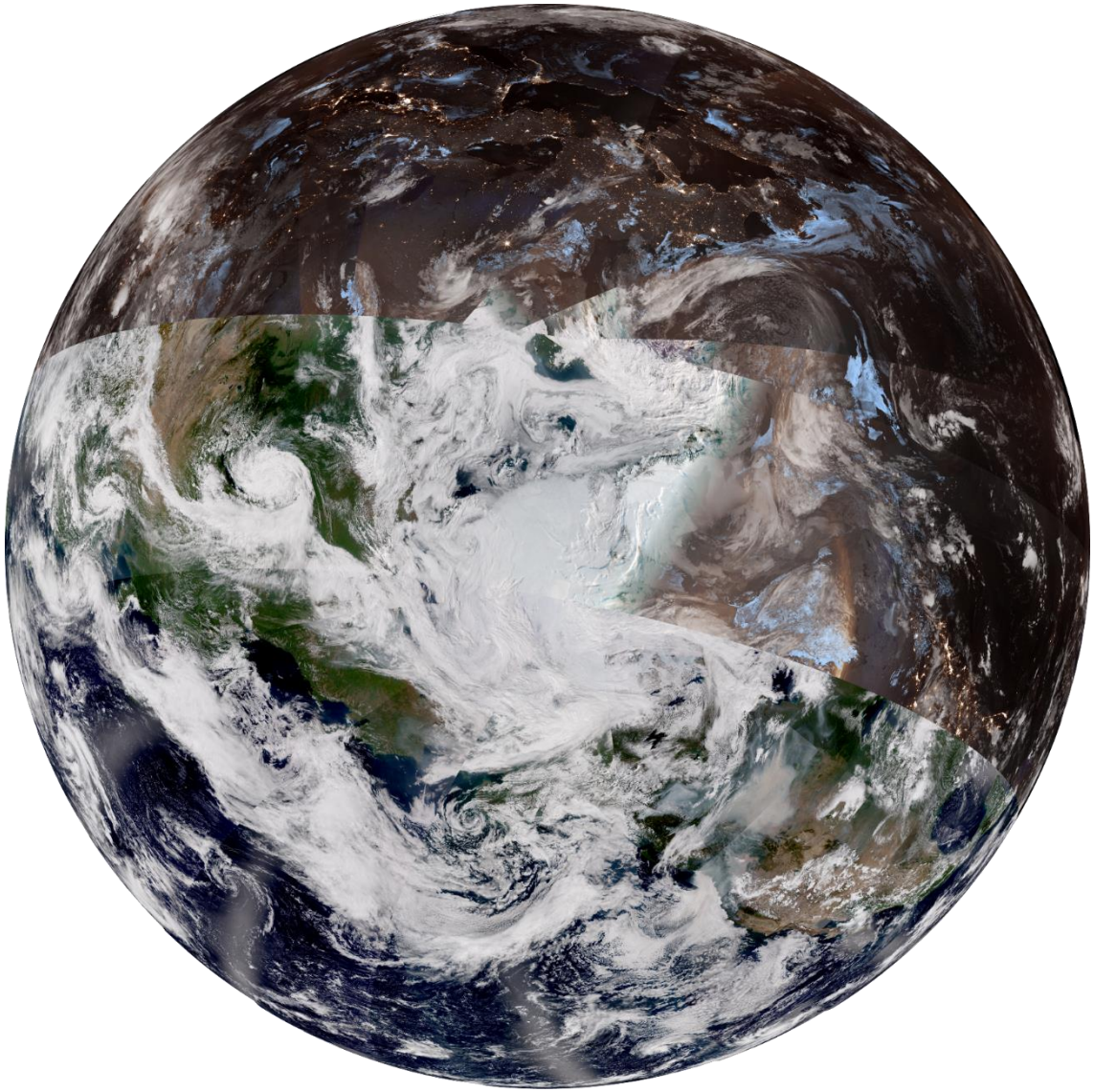
The typical afternoon flare-up of wildfires in British Columbia is evident during this time period in band M-13 (4.0 μm).

Pixels warmer than 60 C (333 K) are highlighted in red.

Antarctica in M-13 (4.0 µm)



New for SLIDER: VIIRS GeoColor



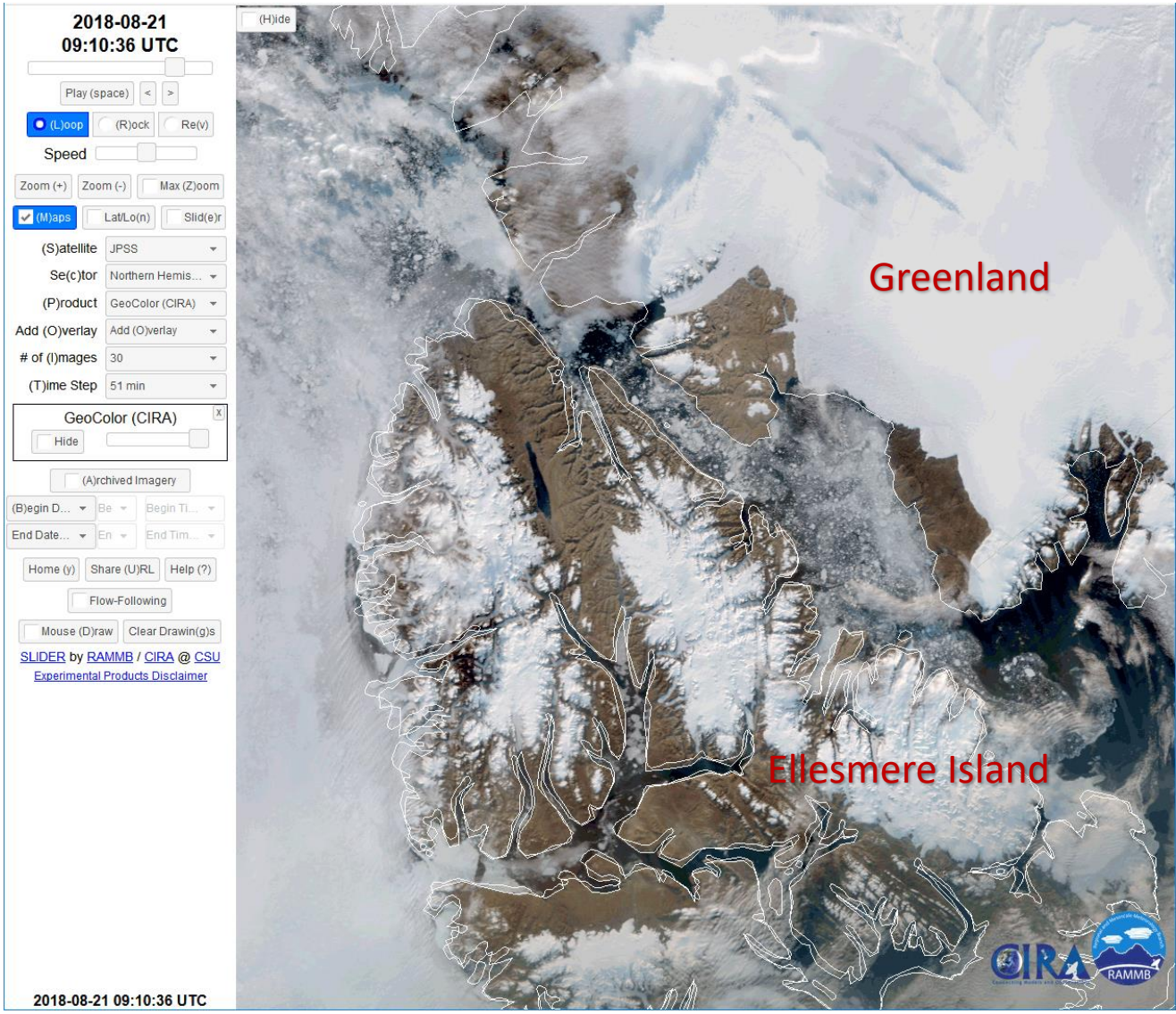
VIIRS GeoColor combines True Color imagery during the day with a low cloud detection algorithm at night. Because it uses the DNB, it will also show auroras, ship lights and even fires at night. This is a change from geostationary versions of GeoColor, which simply use a static DNB city lights database.

True Color in the Arctic

During the summer months, GeoColor may be used to view the Arctic in true color.

This example shows ice in the Nares Strait between Greenland and Ellesmere Island, Canada.

Animated GIF



GeoColor for Antarctica

This example shows the coast of Antarctica in GeoColor during the long polar night. You can expect something similar in the Arctic during the winter.

Blowing Snow?

Animated GIF

Lots To Do

Currently working for 11 of 16 M-bands + DNB
- Once all bands are running in real time, the images will be sent to the public server

Imperfections in GeoColor
- Low cloud detection at night
- Auroras appear yellow, instead of green

All your favorite RGBs to follow:
- Natural Color/Day Land Cloud RGB at 375 m resolution!

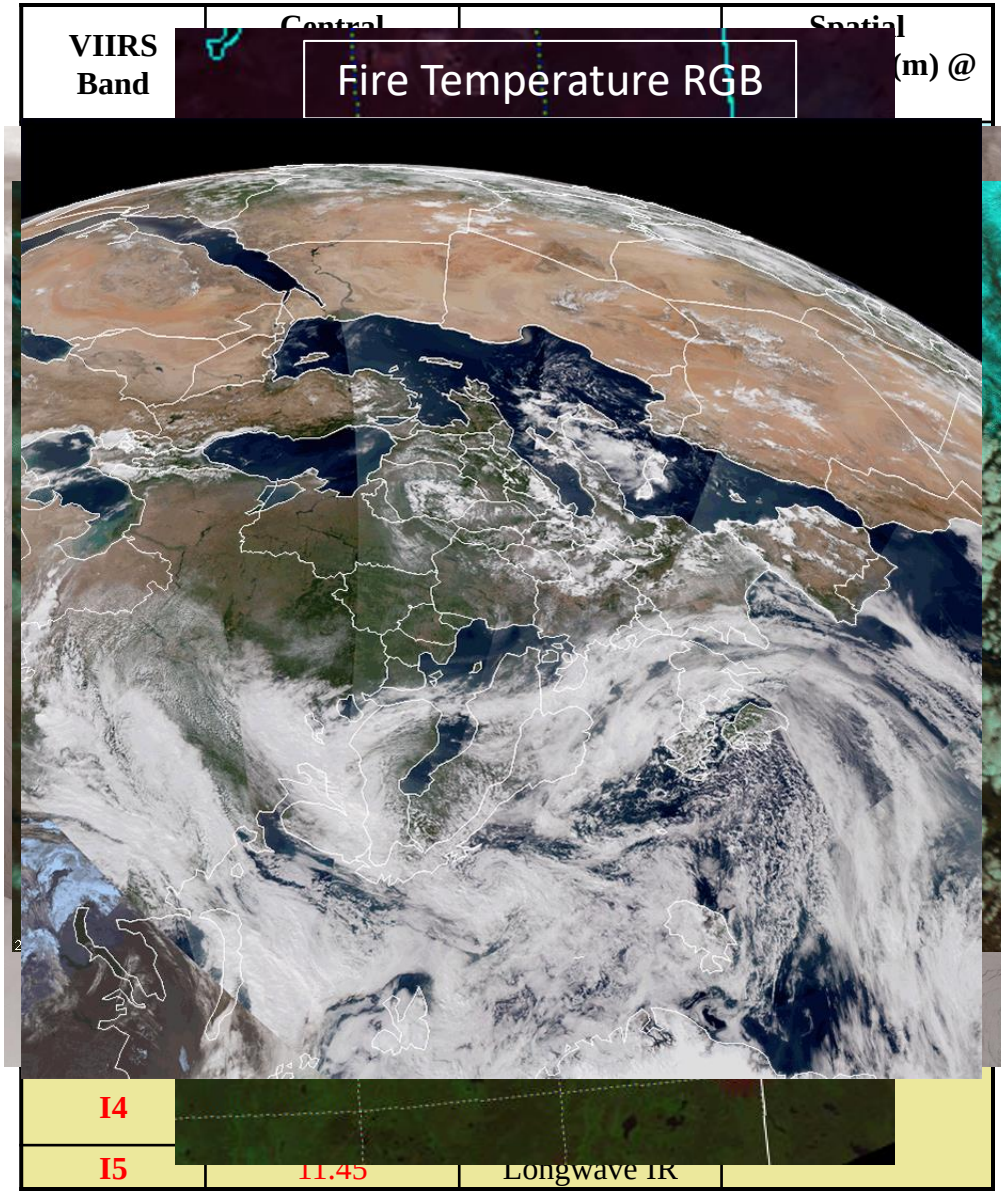
- Fire Temperature and Natural Fire Color/Day Land Cloud Fire RGB

- Day/Night Snow/Cloud Discriminator
… and many more!

Extend Polar SLIDER to additional JPSS products
- Cold Air Aloft (shown here)
- Cloud and other EDR products
- Microwave, Blended TPW/LPW …

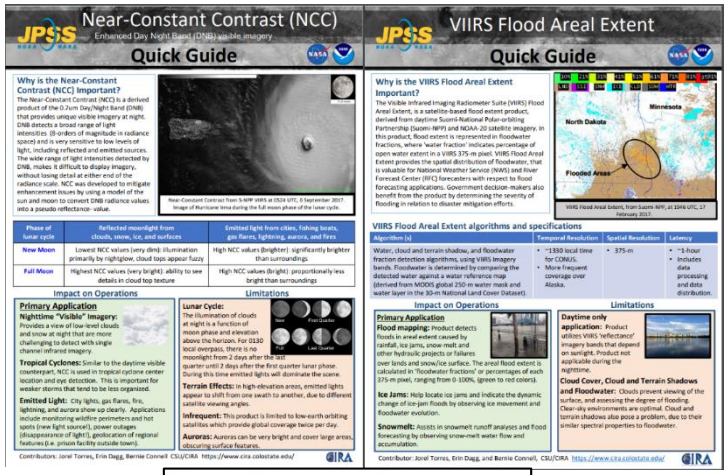
Coming soon: Rotate feature in SLIDER!

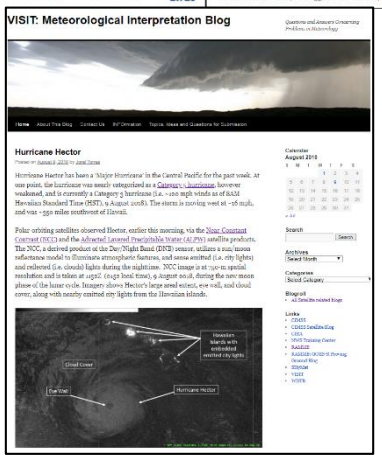
Polar SLIDER will become available to the public at http://rammb-slider.cira.colostate.edu
(Under the satellite menu, choose "JPSS")



JPSS Training

- Satellite Foundational Course for JPSS (SatFC-J)
  - Consists of JPSS training modules. Course duration: 3-4 hours.
  - Available FALL 2018 for NWS forecasters and non-AWIPS users.
- In complement to SatFC-J, JPSS Product and Application Reference Materials are currently in development.
  - Quick Guides (1-2 page documents), Quick Briefs (3-5 minute videos) and Job Aides (Product Exercises).
  - JPSS/GOES Quick Guide and Quick Brief web-links via CIRA/VISIT and STOR within NOAA Vlab.
    - http://rammb.cira.colostate.edu/training/visit/quick_guides/
    - http://rammb.cira.colostate.edu/training/visit/quick_briefs/
    - https://vlab.ncep.noaa.gov/web/stor/polar2
- More JPSS Products will be available in AWIPS via SBN in CY 2018, and CY 2019 (e.g. CONUS Sector, NOAA-20 NCC and NUCAPS, tentative date: Dec 2018).
- Satellite Blogs:
  - VISIT Meteorological Interpretation Blog: http://rammb.cira.colostate.edu/training/visit/blog/
  - Seeing the Light: VIIRS in the Arctic Blog: http://rammb.cira.colostate.edu/projects/alaska/blog/
- Upcoming JPSS Training Workshop at AMS 99th Annual Meeting in Phoenix, AZ. For more information contact Jorel Torres (CIRA): jorel.torres@colostate.edu





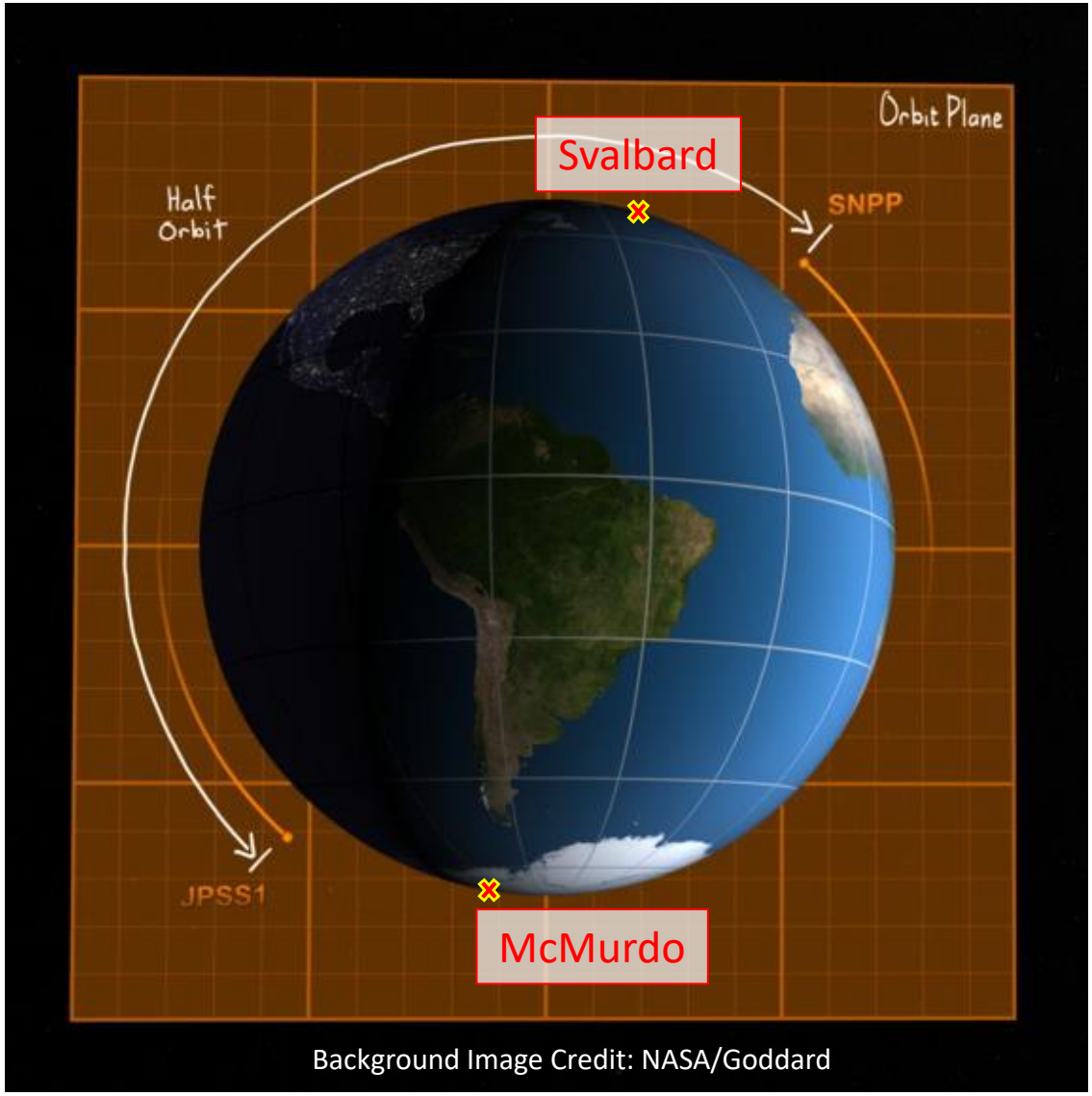
Cautionary Tales

Full resolution images are 16,000 x 16,000 pixels (M-bands & DNB), 32,000 x 32,000 (I-bands), which puts more strain on your web browser than GOES-R ABI.

Each individual orbit image contains ~51 min. of data. Image time stamps are set to match the last VIIRS granule to cross the Equator in each hemisphere. At this time, we lack the ability to go back and reprocess missing granules.

S-NPP data is only downlinked from Svalbard. NOAA-20 data is downlinked from both Svalbard and McMurdo. This means more recent NOAA-20 data may arrive before older S-NPP data. The final images are sent to SLIDER after S-NPP processing is complete.

With current computing power, it takes ~50 minutes to process the ~100 min. of data from each orbit (M-bands).



Background Image Credit: NASA/Goddard

Smoke Transport

Smoke from fires in the Pacific Northwest advects all the way to the U.S. Midwest, Great Lakes and Hudson Bay.

Smoke plumes are also visible near the Ontario-Manitoba border.

Animated GIF